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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/813,352	03/30/2004	Kangguo Cheng	FIS920030369US1 (17141)	4990

23389 7590 12/12/2006

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EXAMINER
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LANDAU, MATTHEW C

ART UNIT	PAPER NUMBER
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2815

DATE MAILED: 12/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/813,352

Applicant(s)

CHENG ET AL.

Examiner

Matthew Landau

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 and 21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 8,9 and 21 is/are allowed.
- 6) ☒ Claim(s) 1,3,5-7 and 10 is/are rejected.
- 7) ☒ Claim(s) 2 and 4 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Drawings***

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the at least one other type memory device, wherein said further-offset buried strap is located at another depth that is different from said first depth (claim 2) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

*Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claim 1, 5, 6, and 10 are rejected under 35 U.S.C. 102(a) as being anticipated by Hsu et al. (US Pat. 6,570,207, hereinafter Hsu).

Regarding claim 1, Figures 10 and 11 of Hsu discloses a first type-memory device 10c comprising a first transistor 25C, first underlying capacitor 26, a first buried strap 27, and a first collar region 34 with a first vertical length (length of portion below STI region 20), wherein said first buried strap is located at a first depth and is position on said first collar region and is in electrical contact with both said first transistor and said first underlying capacitor; and a second-type memory device 10 comprising a second transistor, a second capacitor 17, an offset buried strap 13, and a second collar region 18 with a second vertical length (length of portion below STI region 20), wherein said offset buried strap is located at a second depth that is different from said first depth and is positioned on said second collar region and is in electrical contact with both said second transistor and said second underlying capacitor, and said second vertical length is equal to said first vertical length. Note that the collar length on the right side of device 10C is the same as the collar length on the right side of device 10.

Regarding claim 5, Figure 11 of Hsu discloses a support region (substrate).

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Regarding claim 6, Figure 11 of Hsu discloses the first-type memory device is formed within a first trench and the second-type memory device is formed within a second trench.

Regarding claim 10, Figures 10 and 11 of Hsu disclose said first and second underlying capacitors have a vertical orientation.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsu.

Regarding claim 3, Hsu does not specifically disclose the offset between the first buried strap region and the second buried strap region is from about 0.4 microns to about 0.6 microns. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Hsu by selecting a value within the claimed range, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 7, Hsu does not specifically disclose the first and second trenches have a depth from about 1  $\mu\text{m}$  to about 10  $\mu\text{m}$ . However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Hsu by selecting a value within the claimed range, since it has been held that discovering an optimum value of a result

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effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

***Allowable Subject Matter***

Claims 8, 9, and 21 are allowed.

The reasons for allowance of claims 8 and 21 were provided in the Office Action mailed on August 17, 2006.

Claims 2 and 4 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 2, the prior art of record, either singularly or in combination, does not disclose or suggest the combination of limitations including wherein said further-offset buried strap is located at another depth that is different from said first depth and from said second depth.

Regarding claim 4, the prior art of record, either singularly or in combination, does not disclose or suggest the combination of limitations including the depth of said at least one first-bottling region is different from the depth of said at least one offset-bottling region.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Response to Arguments***

Applicant's arguments filed October 17, 2006 have been fully considered but they are not persuasive.

Regarding the drawing objections, Applicant argues "Since all the details of the first-type memory device and second-type memory device are clearly described in the specification and the existing figures alone, with the only difference between them being the placement and vertical height of specific elements, one of ordinary skill in the art would be able to construct a structure containing "further-offset" buried strap, and therefore other-type memory devices as well. Therefore, an additional drawing illustrating the other-type memory device is not necessary for the understanding of the present invention, including the features in Claim 2". These arguments appear to be more related to matters involving 35 U.S.C 112 rejections. However, the examiner has not presented any 112, 1<sup>st</sup> or 2<sup>nd</sup> paragraph rejections of claim 2. The claims were merely objected to for not showing all claimed features. Rule 37 CFR 1.83(a) states:

"The drawing in a nonprovisional application must show every feature of the invention specified in the claims. However, conventional features disclosed in the description and claims, where their detailed illustration is not essential for a proper understanding of the invention, should be illustrated in the drawing in the form of graphical drawing symbol or a labeled representation (e.g. a labeled rectangular box)."

The rule makes no exception for claimed features that are "not necessary for the understanding of the present invention". Applicant must submit drawings that show every claimed feature, or cancel those limitations from the claim.

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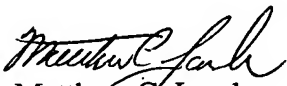
Applicant argues that Hsu does not disclose "different offsets in the depth of the buried strap with identical vertical lengths for collar regions. However, as indicated in the above rejection, the collar regions each have portions below the STI regions 20 (as shown in Figure 11 of Hsu) which have equal vertical lengths.

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew C. Landau whose telephone number is (571) 272-1731.

The examiner can normally be reached from 8:30 AM - 5:30 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Parker can be reached on (571) 272-2298. The fax phone numbers for the organization where this application or proceeding is assigned are (571) 273-8300 for regular communications and (571) 273-8300 for After Final communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should any questions arise regarding access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Matthew C. Landau

December 9, 2006